

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference AGP16102PCT	FOR FURTHER ACTION See item 4 below	
International application No. PCT/JP2004/015585	International filing date (<i>day/month/year</i>) 21 October 2004 (21.10.2004)	Priority date (<i>day/month/year</i>) 22 October 2003 (22.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant TOSHIBA MATSUSHITA DISPLAY TECHNOLOGY CO., LTD.		

- This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
- This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

- This report contains indications relating to the following items:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report |
| <input type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> Box No. VIII | Certain observations on the international application |

- The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 27 July 2006 (27.07.2006)
	Authorized officer Masashi Honda e-mail: pt08@wipo.int

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **18.01.2005**

Applicant's or agent's file reference
AGP16102PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/015585

International filing date (day/month/year)
21.10.2004

Priority date (day/month/year)
22.10.2003

International Patent Classification (IPC) or both national classification and IPC
G 0 2 F 1 / 1 3 4 3 , G 0 2 F 1 / 1 3 3 5

Applicant
TOSHIBA MATSUSHITA DISPLAY TECHNOLOGY CO., LTD.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/015585

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/JP2004/015585

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations:

Document 1: JP 8-122803 A (Casio Computer Co., Ltd.), 17 May 1996, entire text, all drawings (Family: none)

Document 2: JP 7-168173 A (Canon Inc.), 4 July 1995, entire text, all drawings (Family: none)

Document 3: JP 2003-140194 A (Mitsubishi Electric Corp.), 14 May 2003, claim 1 (Family: none)

The invention set forth in claims 1 to 8 does not involve an inventive step in the light of document 1 cited in the international search report.

Document 1 discloses a liquid crystal display cell having a TFT substrate (41) comprising a matrix arrangement of pixel electrodes (52) and TFTs (51) that are connected to each of the pixel electrodes, a counter electrode substrate (42) on which are arranged counter electrodes (63) comprising ITO and which is arranged so as to face the aforementioned TFT substrate with a gap provided therebetween, and color filters (61) for each pixel which are arranged on the aforementioned counter electrode substrate so as to face each of the pixel electrodes.

WRITTEN OPINION OF THE
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International application No.
PCT/JP2004/015585

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

Further, in the invention disclosed in document 1, the thickness of the counter electrodes varies depending on the corresponding color, with the thickness set so as to maximize the light transmissivity at the wavelength for which the transmissivity peak for that color filter is indicated. Moreover, the thickness for a portion facing a blue color filter is $135 \text{ nm} \pm 30 \text{ nm}$. Meanwhile, document 1 (fig. 2) indicates that, when the thickness of an ITO counter electrode is 120 nm, the transmissivity is greatest at wavelengths of 440 to 450 nm. Thus, the "portion facing a blue color filter" in the invention disclosed in document 1 corresponds to the feature described in the present claims 1 and 3 wherein "the minimum value for the frontal reflectance spectrum of the portion of the aforementioned counter electrode corresponding to a blue color filter layer falls within a range of 380 to 480 nm."

Furthermore, document 1 (fig. 1, fig. 4) discloses a feature wherein color filters are arranged between the counter electrode substrate and the counter electrodes, and indicates a relationship wherein $t_B < t_G < t_R$ (symbols used here denote film thickness, as in the present claim 4).

Moreover, document 1 (claim 3) states that $t_B = 135 \text{ nm} \pm 30 \text{ nm}$, $t_G = 165 \text{ nm} \pm 30 \text{ nm}$, and $t_R = 200 \text{ nm} \pm 30 \text{ nm}$. The refractive index of ITO, n , is approximately 1.9, and thus, the above numerical ranges correspond to $200 \text{ nm} < nt_B < 313 \text{ nm}$, $256 \text{ nm} < nt_G < 370 \text{ nm}$, and $323 \text{ nm} < nt_R < 437 \text{ nm}$, which includes the same range of values as those stipulated in the present claim 5.

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

Further, the arranging of a phase difference plate in a liquid crystal cell is known in the art (see JP 2003-255396 A, fig. 8, for example).

Meanwhile, the use of bend orientation as an orientation method for the liquid crystals in a liquid crystal display cell is known in the art (see document 3, for example), and thus, a person skilled in the art could easily conceive of applying bend orientation to the liquid crystal layer in the liquid crystal cell disclosed in document 1.

The invention set forth in claims 1 to 8 does not involve an inventive step in the light of document 2 cited in the international search report and document 1.

Document 2 discloses a liquid crystal display cell provided with a TFT substrate and a color filter layer, wherein the thickness of a transparent conductive film is adjusted according to light wavelength in order to limit the reflectivity of the aforementioned transparent conductive film, and indicates that the film thickness is $\lambda/2n$ (where λ is the light wavelength and n the refractive index of the transparent conductive film) (see document 2, paragraphs [0005] and [0025]). When the peak wavelengths indicated in paragraph [0058] of the description of the present application (red: 610 nm, green: 540 nm, blue: 435 nm) and the refractive index of ITO (1.9) are inserted into the above expression, $t_B = 114$ nm, $nt_B = 218$ nm, $nt_G = 270$ nm, and $nt_R = 305$ nm, which are included in the range of values stipulated in the present claims 1 and 4.

WRITTEN OPINION OF THE
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PCT/JP2004/015585

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

Further, document 1 discloses a feature wherein the thickness of the ITO is varied according to the color of the corresponding color filter.

Therefore, a person skilled in the art could easily conceive of adapting the liquid crystal display cell wherein the thickness of a transparent conductive film is adjusted in order to limit the reflectivity of the transparent conductive film, disclosed in document 2, by implementing the constitution wherein film thickness is varied according to the color of a color filter, disclosed in document 1, and further, of implementing a known bend orientation for liquid crystal orientation.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PNHA-16434	FOR FURTHER ACTION	See item 4 below
International application No. PCT/JP2004/013840	International filing date (<i>day/month/year</i>) 22 September 2004 (22.09.2004)	Priority date (<i>day/month/year</i>) 27 October 2003 (27.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NHK SPRING CO., LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Date of issuance of this report 20 June 2006 (20.06.2006)</td> </tr> <tr> <td style="padding: 5px;">Authorized officer Yoshiko Kuwahara</td> </tr> <tr> <td style="padding: 5px;">Telephone No. +41 22 338 90 90</td> </tr> </table>	Date of issuance of this report 20 June 2006 (20.06.2006)	Authorized officer Yoshiko Kuwahara	Telephone No. +41 22 338 90 90
Date of issuance of this report 20 June 2006 (20.06.2006)				
Authorized officer Yoshiko Kuwahara				
Telephone No. +41 22 338 90 90				

PATENT COOPERATION TREATY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

Date of mailing
(day/month/year)

Applicant's or agent's file reference
PNHA-16434

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/JP2004/013840

International filing date (day/month/year)
22.09.2004

Priority date (day/month/year)
27.10.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant
NHK SPRING CO., LTD.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
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2. **FURTHER ACTION**

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If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/013840

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/013840

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-24	YES
	Claims		NO
Inventive step (IS)	Claims	1-24	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims		NO

2. Citations and explanations:

Claims 1-24

Inventions related to claims 1-24 are not described in any of the documents cited in the ISR, nor are obvious to a person skilled in the art.